DataStar Web

Documents

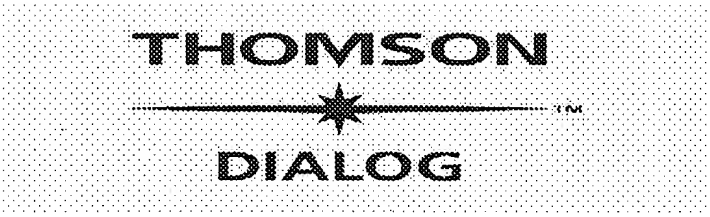

Table of Contents

Efficient management of in-place *path* metric update and its implementation for Viterbi decoders.

Accession number & update
6021222, B9810-1265F-067, C9810-5135-019; 980908.

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ISCAS '98 Proceedings of the 1998 IEEE International Symposium on Circuits and Systems, vol.4, Monterey, CA, USA, 31 May-3 June 1998.
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1998.

Language
EN.

Publication type
CPP Conference Paper.

Treatment codes
A Application; P Practical.

Abstract
The in-place ***path*** metric scheduling is known as an efficient approach for sequential processing of the ***trellis,*** where the number of add compare select (ACS) units or processors is less than the number of states. In this paper, a systematic approach to partitioning a centralized memory into several banks to increase the memory bandwidth for in-place ***path*** metric update in Viterbi decoders is presented. Similar concepts can be extended to distribute the memory banks into ACS units if the ACS units are scheduled correspondingly to keep the interconnection minimal. Implementation results show that in terms of trade-off between hardware overhead and required memory bandwidth, an expected performance improvement can be achieved based on the proposed technique, especially for the ***trellis*** with a long constraint length. (8 refs).

Descriptors
digital-signal-processing-chips; memory-architecture; performance-evaluation; processor-scheduling; random-access-storage; storage-management; Viterbi-decoding.

Keywords
in place ***path*** metric update; Viterbi decoders; sequential processing; add compare select units; centralized memory partitioning; memory bandwidth improvement; in place ***path*** metric scheduling; hardware overhead; performance improvement; long constraint length ***trellis;*** DSP chip.

Classification codes
B1265F (Microprocessors and microcomputers).
B1265D (Memory circuits).
B6120B (Codes).
C5135 (Digital signal processing chips).
C6120 (File organisation).
C5310 (Storage system design).
C5320G (Semiconductor storage).

A truncated *best-path* algorithm.

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5922741, B9807-6120B-011; 980527.
Author(s)
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Narrowband Telecommun Res Inc, Burnaby, BC, Canada.
Source
IEEE-Transactions-on-Communications (USA), vol.46, no.5, p.568-72, May 1998. , Published: IEEE.
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ISSN: 0090-6778, CCCC: 0090-6778/98/ ($10.00).
Availability
SICI: 0090-6778(199805)46:5L.568:TBPA; 1-6
Electronic Journal Document Number: S0090-6778(98)03861-6.
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1998.
Language
EN.
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J Journal Paper.
Treatment codes
T Theoretical or Mathematical.
Abstract
A variant of the ***best-path*** (BP) algorithm that can be used for deducing a posteriori symbol probabilities for input sequences of unlimited length is proposed. Decoders using the proposed algorithm have fixed memory requirements and fixed decoding delays regardless of the length of the transmitted sequence. This is made possible by utilizing the Viterbi algorithm's ability to self-initialize itself and by segmenting the decoding process. (6 refs).
Descriptors
convolutional-codes; delays; probability; sequences; ***trellis-codes;*** Viterbi-decoding.
Keywords
truncated best ***path*** algorithm; BP algorithm; a posteriori symbol probabilities; unlimited length input sequences; fixed memory requirements; fixed decoding delays; transmitted sequence length; Viterbi algorithm; self initialization; segmentation; decoding process.
Classification codes
B6120B (Codes).
B0240Z (Other topics in statistics).
Copyright statement

Addressing network survivability issues by finding the K-best paths through a *trellis* graph.

Accession number & update
5911757, B9806-6150P-010; 980512.
Author(s)
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Source

Proceedings of INFOCOM '97, vol.1, Kobe, Japan, 7-11 April 1997.
Sponsors: IEEE Comput. Soc. Tech. Committee on Comput. Commun., IEEE Commun. Soc., IEICE of Japan, IPS (Inf. Process. Soc.) of Japan, ORS (Oper. Res. Soc.) of Japan.
In: p.370-7 vol.1, 1997.

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ISBN: 0-8186-7780-5, CCCC: 0 8186 7780 5/97/ ($10.00).

Publication year

1997.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

T Theoretical or Mathematical.

Abstract

Due to the increasing reliance of society on the timely and reliable transfer of large quantities of information (such as voice, data, and video) across high speed communication networks, it is becoming important for a network to offer survivability, or at least graceful degradation, in the event of network failure. In this paper we aim to offer a solution in the selection of the K-best disjoint paths through a network by using graph theoretic techniques. The basic approach is to map an arbitrary network graph into a ***trellis*** graph which allows the application of computationally efficient methods to find disjoint paths. Use of the knowledge of the K-best disjoint paths for improving the survivability of ATM networks at the virtual ***path*** and virtual circuit level is discussed. (16 refs).

Descriptors

asynchronous-transfer-mode; directed-graphs; telecommunication-network-management; telecommunication-network-reliability; telecommunication-network-routing.

Keywords

network survivability issues; K best paths; ***trellis*** graph; high speed communication networks; degradation; network failure; disjoint paths; graph theoretic techniques; network graph; ATM networks; virtual ***path;*** virtual circuit level.

Classification codes

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B6150P    (Communication network design and planning).
B0250     (Combinatorial mathematics).
B6150C    (Communication switching).
B6210C    (Network management).
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Copyright statement

Look-ahead predictive *trellis-coded* quantization with nonlinear filters for image transmission over tactical channels.

Accession number & update

5568060, B9706-7930-021; 970507.

Author(s)

Marvel-L-M; Boncelet-C-G-Jr.

Source

Visual Communications and Image Processing '97, San Jose, CA, USA, 12-14 Feb. 1997.
Sponsors: SPIE, Soc. Imaging Sci. & Technol., IEEE Circuits & Syst. Soc.
In: Proceedings-of-the-SPIE-The-International-Society-for-Optical-Engineering (USA), vol.3024, pt.2,

p.799–807, 1997.

CODEN

PSISDG.

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ISSN: 0277–786X, CCCC: 0 8194 2435 8/97/ ($10.00).

Availability

SICI: 0277–786X(1997)3024:2L.799:LAPT; 1–6.

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Publication type

CPP Conference Paper, J Journal Paper.

Treatment codes

P Practical; T Theoretical or Mathematical.

Abstract

Many battlefield applications require the ability to transmit images over narrow bandwidth noisy channels. Previous research has demonstrated that the utilization of predictive ***trellis–coded*** quantization (PTCQ) incorporating a nonlinear prediction filter results in a method of robust source coding. Robust source coding provides both compression and noise mitigation without the need to allocate additional bandwidth for channel coding. However, the traditional PTCQ algorithm is suboptimal. This suboptimality arises from the prediction operation; a ***trellis path*** is eliminated in favour of the survivor ***path*** at each stage in time to form the input to the prediction filter. It is reasonable to assume that this eliminated ***path*** may have produced a lower overall distortion than the survivor ***path.*** In this paper we address this suboptimality by incorporating a look–ahead stage into PTCQ algorithm. This "less–greedy" approach allows coding gains with a slight increase in overhead. The resulting algorithm yields an image encoding technique which enables resilient image transmission over tactical channels. (7 refs).

Descriptors

channel–coding; data–compression; image–coding; military–communication; noise; nonlinear–filters; prediction–theory; quantisation–signal; source–coding; telecommunication–channels; ***trellis–codes;*** visual–communication.

Keywords

look ahead predictive ***trellis*** coded quantization; nonlinear filters; image transmission; tactical channels; battlefield applications; narrow bandwidth noisy channels; predictive ***trellis*** coded quantization; PTCQ; nonlinear prediction filter; robust source coding; channel coding; prediction filter; coding gains; image encoding technique.

Classification codes

B7930 (Military communications).
B6120B (Codes).
B6140C (Optical information, image and video signal processing).

Copyright statement

A generalized precompiling scheme for surviving *path* memory management in Viterbi decoders.

Accession number & update

4996953, B9508–6120B–072, C9508–6120–041; 950713.

Author(s)

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Source

1993 IEEE International Symposium on Circuits and Systems, Chicago, IL, USA, 3–6 May 1993. Sponsors: IEEE.

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ISSN

ISBN: 0–7803–1281–3, CCCC: 0–7803–1254–6/93/ ($03.00).

Publication year

1993.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

P Practical; T Theoretical or Mathematical.

Abstract

The management of the surviving ***path*** memory in Viterbi's algorithm is generally performed by trace–back or exchange–register. A generalized method using precompiled trace–backs is presented. Resolution by a graphical method is proposed. Three examples are solved. (7 refs).

Descriptors

storage–management; ***trellis–codes;*** Viterbi–decoding; VLSI.

Keywords

precompiling scheme; surviving ***path*** memory management; Viterbi decoders; Viterbi s algorithm; precompiled trace backs; graphical method.

Classification codes

B6120B (Codes).
B2570 (Semiconductor integrated circuits).
C6120 (File organisation).
C6130 (Data handling techniques).